H1044
H4AR
12.5.1
3/25/09

Ravi Sanga/R10/USEPA/US
03/25/2009 02:06 PM

To susanm@windwardenv.com
cc Lon Kissinger/R10/USEPA/US@EPA
bcc
Subject Fw: EW Tissue compositing thoughts

Susie -- With regards to Lons message below, EPA can support a proposal for compositing tissue for dioxin/furan and congener analysis that includes:

1) Taking a max as an EPC, if three super composites are being proposed or 2) computing an UCL on the mean, as the EPC, if 6 supercomposites are being proposed for analysis.

Before making a decision or approving an approach for tissue compositing for dioxin/furan/congener analysis on EW, EPA expects to solicit input from the trustees/stakeholders on the memo you mention below.

Any questions, give me a call.

Ravi

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----- Forwarded by Ravi Sanga/R10/USEPA/US on 03/25/2009 01:43 PM -----

Lon Kissinger/R10/USEPA/US
03/25/2009 01:27 PM

To Ravi Sanga/R10/USEPA/US@EPA
cc Gina Grepo-Grove/R10/USEPA/US@EPA, susanm@windwardenv.com
Subject Re: EW Tissue compositing thoughts

Hi Ravi,

This was the approach Gina and I had discussed.

Revised approach:
1) Extract 10 grams from each original composite.
2) Combine 20 microliters of each extract (total volume 220 microliters if there are 11 original composites)
3) Homogenize again
4) Split into three equal volumes of approximately 73 microliters
5) Do three analyses for dioxins/furans and PCB congeners

Susy pointed out that this really would only give you measurement error for the analytical instrument

I then suggested that we might analyze groups of composites (e.g. Extracts of composite 1, 2, and 3 go into supercomposite 1; Extracts of composites 4, 5, and 6 go into supercomposite 2; Extracts of composites 7, 8 and 9 go into supercomposite 3). This would result in an estimate of variance for the samples and the underlying population.

A problem occurs when you look at how to combine composite samples to create supercomposites given that we know PCBs by Aroclor now. If you use the available knowledge of Aroclor concentrations you can create supercomposites that will have lower variance. For example, if we created low, medium, and high Aroclor supercomposites from low, medium and high composites, we would have greater variance than if we created supercomposites that each contained low, medium, and high Aroclor composites. A potential solution to this would be for me to determine which composites went into the supercomposites without knowing the Aroclor concentrations. A potential problem with this is that the maximum Aroclor composite might not be selected. Susy was thinking that the time required to sort out these complications might offset analytical savings. She was thinking about potentially going back to running 6 individual composites and computing a UCL using ProUCL.

I did look back at the LDW tissue PCB TEQ data set to examine differences between means, maxima, and 95% UCLs. It turns out that using the maximum of existing values would produce more protective EPCs than using the 95% UCL. So...the PRPs could save on analytical costs and a health protective risk estimate would likely result. Maxima for the EW would be dampened somewhat as a result of using super composites instead of individual composites. Consequently, the degree of risk estimation caused by using maxima vs. 95% UCLs would be lower for the EW relative to the LDW.

	PCBs			PCB TEQ		(1)		(2)	
Species/Tissue Type	Mean	EPC	% Difference	Mean	EPC	% Difference	Max	% Difference	Dif
benthic fish fillet	0.7	1.2	71%	8.80E-06	1.17E-05	33%	1.41E-05	60%	
benthic fish whole body	2.2	2.6	18%	1.59E-05	2.04E-05	28%	2.47E-05	55%	
clams	0.14	0.6	329%	1.48E-06	3.16E-06	114%	5.65E-06	282%	
crab edible meat	0.17	0.2	18%	2.00E-06	2.41E-06	21%	2.93E-06	47%	
crab whole body	0.89	1.1	24%	7.70E-06	9.68E-06	26%	1.16E-05	51%	
mussels	0.034	0.041	21%						
pelagic fish, whole body	1.7	1.9	12%	1.99E-05	3.37E-05	69%	7.30E-05	267%	

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Ravi Sanga/R10/USEPA/US
03/25/2009 12:17 PM

To Lon Kissinger/R10/USEPA/US@EPA
cc
Subject EW Tissue compositing thoughts

Were you OK with this, in particular the number of composite samples per tissue type that Susie proposed for each "super" composite ?

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----- Forwarded by Ravi Sanga/R10/USEPA/US on 03/25/2009 12:15 PM -----

Susan McGroddy <SusanM@windwardenv.com>

03/19/2009 03:58 PM

To Ravi Sanga/R10/USEPA/US@EPA, Lon Kissinger/R10/USEPA/US@EPA

cc dan berlin <dberlin@anchorenv.com>, "Dave Schuchardt (Dave.Schuchardt@Seattle.Gov)" <Dave.Schuchardt@Seattle.Gov>, "Debra Williston (d_williston@msn.com)" (b) (6), "Debra Williston (debra.williston@kingcounty.gov)" <debra.williston@kingcounty.gov>, Doug Hotchkiss <hotchkiss.d@portseattle.org>, Gary Pascoe (b) (6), "Jeff Stern (jeff.stern@kingcounty.gov)" <jeff.stern@kingcounty.gov>, Lisa Gagnon <lgagnon@anchorenv.com>, Nancy Judd <NancyJ@windwardenv.com>, "Pete Rude (pete.rude@seattle.gov)" <pete.rude@seattle.gov>, Scott Becker <sbecker@integral-corp.com>, Susan McGroddy <SusanM@windwardenv.com>, "twang@anchorenv.com" <twang@anchorenv.com>

Subject Tissue compositing thoughts

We are considering creating "super-composite" samples for the analysis of PCB congeners and dioxins and furans in a subset of the tissue samples. The super-composites would be created from aliquots of all available samples for the tissue type. For example, there are 11 composite samples of English sole fillets and the super-composite would be made up using an equal amount of tissue from all 11 composite homogenate samples. Triplicate super-composites would be created with additional homogenization of the original samples occurring following the removal of each aliquot. These triplicates would provide an estimate of analytical variance as well as variance resulting from the homogenization. Super-composite samples are only proposed for species with home-ranges greater than the EW (i.e. shiner surfperch, English sole fillets, English sole whole body and crab (edible meat and hepatopancreas)) for the following reasons:

1. The "super" composite sample would include contributions from all the collected organisms. Therefore, it provides a estimate of the population mean TEQ concentration based on a greater number of individuals than analyzing a subset of the existing composite samples The "super" composite sample would include contributions from all collected organisms/composite samples. This provides an estimate of the population mean TEQ concentration using tissue from all collected organisms.
2. Additional compositing reduces analytical costs while still providing an estimate of the population mean which is the value required for the risk assessments.
3. The creation of a composite is appropriate for species that were composited on a site-wide basis because their home-ranges are larger than the size of the site (i.e. shiner surfperch, English sole fillets, English sole whole body and crab). Species with smaller home ranges (rockfish and

clams) would not be composited beyond the initial compositing that has already been conducted for clams.

The number of composite samples for each tissue type that would be used for each "super" composite is:

English sole fillet: 11
English sole WB: 11
Shiner surfperch WB: 8
Crab edible meat (red rock and dungeness): 9
Crab hepatopancreas (red rock and dungeness): 9

The EWG would like to send a memo outlining the samples for PCB congener and dioxin/furans to you by March 31 or earlier. We'd appreciate your thoughts on the above compositing approach for the specified tissue types by mid-next week so that we can proceed with finalizing the memo for PCB congener and dioxin/furan tissue analysis.

Please call me with any questions.
Susie